

# Practice Quiz 1

Statistics 90-707

Fall 2021

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1. (5 pts.) An article entitled *Moderate walking helps the mind stay sharper* reports that elderly people who walked at least ninety minutes a week were less likely to suffer from mental impairment than those who walked less than forty minutes per week.
  - (a) Report the two variables of interest, which is explanatory and which is response, and whether each is quantitative or categorical. Will results be summarized with means or proportions?
  - (b) The design described is (i) an experiment (ii) an observational study (iii) a survey.
  - (c) Describe a way to gather information about walking habits that is prospective, and another way that is retrospective.
  - (d) The design described is (i) paired (ii) two-sample.
  - (e) Describe at least one additional way that elderly people who walk a lot could differ from those who walk very little.
  - (f) The most worrisome flaw is (i) confounding variables (ii) lack of realism (iii) the placebo effect (iv) people's faulty memories (v) non-compliance.
  - (g) When the researchers designed a questionnaire to determine walking habits, were they focusing on (i) data production, (ii) displaying and summarizing, (iii) probability, or (iv) statistical inference?
  - (h) Apparently the researchers found that the difference in rates of mental impairment was so large that it was unlikely to have occurred by chance. Does this focus on (i) data production, (ii) displaying and summarizing, (iii) probability, or (iv) statistical inference?

2. (5 pts.) Suppose researchers want to test the theory that elderly people who walk a lot have better mental function than those who walk very little. One possible design is to recruit elderly people for a study; assign some of them to walk 90 minutes every week and others to walk only 40 minutes a week. After many weeks, compare scores on a test of cognitive competence for those in the two groups.
- (a) Report the two variables of interest, which is explanatory and which is response, and whether each is quantitative or categorical. Will results be summarized with means or proportions?
  - (b) The design is best described as (i) an experiment (ii) an observational study (iii) a survey.
  - (c) Which is more important: (i) obtaining a random sample of elderly people to participate in the study, or (ii) randomly assigning to 90 or 40 minutes of walking per week?
  - (d) The design described is (i) paired or (ii) two-sample.
  - (e) What is the most obvious reason why some of the elderly people would fail to complete the prescribed 90 minutes of walking per week?
  - (f) The most worrisome flaw is (i) confounding variables (ii) lack of realism (iii) the placebo effect (iv) people's faulty memories (v) non-compliance.
  - (g) One possible error is to conclude those who walk a lot don't have any better mental function than those who walk a little, when in fact they do. Describe the other possible error that can be made.